

DO NOT ENTER: /NB/ (07/15/2008)

CLAIMS

1. (Currently amended) A liquid crystal display apparatus, comprising:
a first panel including:
 - a first transparent substrate having a pixel area;
 - a thin film transistor disposed at the pixel area so as to output a pixel voltage;
 - a first color filter disposed at the pixel area, the first color filter having a first edge;
 - a second color filter disposed adjacent to the first color filter and having a second edge, the first edge and the second edge being overlapped to provide an overlapped area between the first color filter and the second color filter;
 - a spacer disposed on the overlapped area between the first color filter and the adjacent second color filter, the spacer having a same material as one of the first color filter and the second color filter, and
 - a pixel electrode disposed on the first color filter so as to receive the pixel voltage;
a second panel including:
 - a second transparent substrate; and
 - a common electrode disposed on the second transparent substrate;
 - a transparent spacer formed on the common electrode, the transparent spacer contacting with an end portion of the spacer, and
a liquid crystal layer disposed between the first and second panels, wherein an opening is formed through each of the first color filter and the second color filter to partially expose the thin film transistor, and the pixel electrode is electrically connected to the thin film transistor through the opening.

2. (Previously presented) The liquid crystal display apparatus of claim 1, wherein a first color filter comprises a red color filter, a green color filter and a blue color filter, and the spacer comprises at least one of a red color filter, a green color filter and a blue color filter.

LAW OFFICES OF
MACPHERSON KWOK CHEN &
HEID LLP
1000 Von Karman
SUITE 713
IRVINE, CALIFORNIA 92618
(949) 752-7349
FAX: (408) 392-4952

3. (Previously presented) The liquid crystal display apparatus of claim 1, wherein the second panel further comprises a light blocking pattern having a lattice-shape, which is disposed on the common electrode, the light blocking pattern that transmits light incident into the pixel area and blocks light incident into between the pixel area and an adjacent pixel area.

4. (Previously presented) The liquid crystal display apparatus of claim 3, wherein the liquid crystal layer comprises liquid crystal molecules vertically aligned, and the second panel further comprises a light visual angle pattern disposed on the common electrode and formed at a position corresponding to the pixel area so as to widen a visual angle of an image.

5. (Previously presented) The liquid crystal display apparatus of claim 1, wherein the second panel further comprises a light blocking pattern having a lattice-shape, which is disposed between the second transparent substrate and common electrode and formed at a position corresponding to a space between the pixel area and adjacent pixel area, so as to block light incident into between the pixel area and an adjacent pixel area.

6. (Previously presented) The liquid crystal display apparatus of claim 5, wherein the liquid crystal layer comprises liquid crystal molecules vertically aligned, and the second panel further comprises a light visual angle pattern disposed between the second transparent substrate and common electrode and formed at the position corresponding to the pixel area so as to widen a visual angle of an image.

7. (Previously presented) The liquid crystal display apparatus of claim 1, wherein the second panel further comprises:

a light blocking pattern having a lattice-shape, which is disposed on the common electrode and formed at a position corresponding to a space between the pixel area and adjacent pixel area, so as to block light incident into between the pixel area and an adjacent pixel area; and

a photosensitive pattern disposed on the light blocking pattern.

LAW OFFICES OF
MACPHERSON KWOK CHEN &
HEID LLP
1000 Von Karman
Suite 1000
Irvine, CA 92610
(714) 757-9000
FAX: (714) 757-9023

DO NOT ENTER: /NB/ (07/15/2008)

8. (Previously presented) The liquid crystal display apparatus of claim 7, wherein the liquid crystal layer comprises liquid crystal molecules vertically aligned, and the second panel further comprises a first light visual angle pattern disposed on the common electrode and formed at a position corresponding to the pixel area so as to widen a visual angle of an image; and

a second light visual angle pattern disposed on the first light visual angle pattern.

9. (Previously presented) The liquid crystal display apparatus of claim 1, wherein the second panel further comprises:

a light blocking pattern having a lattice-shape, which is disposed between the second transparent substrate and common electrode and formed at a position corresponding to a space between the pixel area and an adjacent pixel area, the light blocking pattern that transmits light incident into the pixel area and blocks light incident into between the pixel area and the adjacent pixel area; and

a photosensitive pattern disposed on the light blocking pattern.

10. (Previously presented) The liquid crystal display apparatus of claim 9, wherein the liquid crystal layer comprises liquid crystal molecules vertically aligned, and the second panel further comprises a first light visual angle pattern disposed between the first transparent substrate and common electrode and fanned at a position corresponding to the pixel area so as to widen a visual angle of an image and a second light visual angle pattern disposed on the first light visual angle pattern.

11. (Previously presented) The liquid crystal display apparatus of claim 1, wherein the liquid crystal layer comprises liquid crystal molecules vertically aligned, and wherein the second panel further comprises:

a light blocking pattern having a lattice-shape, which is disposed between the second transparent substrate and common electrode so as to transmit light incident into the pixel area and block light incident into between the pixel area and an adjacent pixel area; and

a light visual angle pattern disposed on common electrode and formed at a position corresponding to the pixel area so as to widen a visual angle of an image.

LAW OFFICES OF
MACPHERSON KWOK &
HEID LLP
1020 Van Kamm
Suite 1000
Austin, TX 78701
(512) 775-7040
(800) 373-9200

DO NOT ENTER: /NB/ (07/15/2008)

12. (Previously presented) The liquid crystal display apparatus of claim 11, wherein the second panel further comprises a transparent spacer disposed on the common electrode corresponding to the light blocking pattern.

13. (Previously presented) The liquid crystal display apparatus of claim 1, wherein the second panel further comprises a light visual angle pattern disposed on the common electrode corresponding to the pixel area so as to widen a visual angle of an image.

14. (Previously presented) The liquid crystal display apparatus of claim 13, wherein the second panel further comprises a transparent spacer disposed on the common electrode corresponding to the spacer.

15. (Previously presented) The liquid crystal display apparatus of claim 1, wherein the liquid crystal layer comprises liquid crystal molecules vertically aligned, and the second panel further comprises a light visual angle pattern disposed between the common electrode and second transparent substrate and formed at a position corresponding to the pixel area so as to widen a visual angle of an image.

16. (Canceled)

17. (Withdrawn) A method of manufacturing a liquid crystal display apparatus, comprising:

forming a first substrate including;

forming a pixel voltage applying part so as to output a pixel voltage to each pixel area of a first transparent substrate;

forming a color filter and a color filter spacer having a same material as the color filter, the color filter corresponding to the pixel area and the color filter spacer being formed at a position corresponding to a space between the pixel area and an adjacent pixel area; and

forming a pixel electrode on the color filter to form a first substrate, the pixel electrode receiving the pixel voltage;

LAW OFFICES OF
MACPHERSON KWOK, CHEN &
HEID LLP
1500 Van Ness
Suite 1000
San Francisco, CA 94102
(415) 752-7040
FAX (415) 752-6782

DO NOT ENTER: /NB/ (07/15/2008)

forming a common electrode, which is facing the pixel electrode, on a second transparent substrate to form a second substrate, the second transparent substrate combining with the first transparent substrate; and
disposing liquid crystal between the first and second substrates.

18. (Withdrawn) The method of claim 17, wherein the color filter and color filter spacer are formed by:

forming a red color filter layer on the second transparent substrate;
patternning the red color filter layer to form a red color filter at an n th pixel area, where n is a natural number, and a red color filter spacer between the pixel area and the adjacent pixel area;
forming a green color filter layer on the second transparent substrate;
patternning the green color filter layer to form a green color filter at an $(n+1)$ th pixel area and a green color filter spacer on the red color filter spacer;
forming a blue color filter layer on the second transparent substrate; and
patternning the blue color filter layer to form a blue color filter at an $(n+2)$ th pixel area and a blue color filter spacer on the green color filter spacer.

19. (Withdrawn) The method of claim 17, prior to forming the common electrode, further comprising:

forming a light blocking layer on the second transparent substrate; and
patternning the light blocking layer to form a light blocking pattern having a lattice-shape, the light blocking pattern transmitting light incident into the pixel area and blocking light incident into between the pixel area and adjacent pixel area.

20. (Withdrawn) The method of claim 19, wherein a light visual angle pattern is further formed on the second transparent substrate so as to widen a visual angle of an image while the light blocking layer is patterned.

21. (Withdrawn) The method of claim 17, prior to forming the common electrode, further comprising:

forming a light blocking layer on the second transparent substrate;
forming a transparent organic layer on the light blocking layer;

LAW OFFICES OF
MACPHERSON KWOK CHEN &
HEID LLP
18200 Von Karman
Suite 100
Irvine, CA 92614
(714) 733-7040
FAX (714) 733-7052

DO NOT ENTER: /NB/ (07/15/2008)

patterning the transparent organic layer to form a transparent spacer facing the color filter spacer; and

patterning the light blocking layer to form a light blocking pattern under the transparent spacer.

22. (Withdrawn) The method of claim 21, wherein a light visual angle pattern is further formed on the second transparent substrate corresponding to the pixel area so as to widen a visual angle of an image while the light blocking layer is patterned.

23. (Withdrawn) The method of claim 17, prior to forming the common electrode, further comprising:

forming a light blocking layer on the second transparent substrate;

forming a photosensitive layer on the light blocking layer; and

patterning the photosensitive layer to form a first photosensitive pattern having a lattice-shape, the first photosensitive pattern transmitting light incident into the pixel area and blocking light incident into between the pixel area and adjacent pixel area; and

patterning the light blocking layer using the first photosensitive pattern as a mask to form a light blocking pattern under the first photosensitive pattern.

24. (Withdrawn) The method of claim 23, wherein the first photosensitive pattern is formed by:

patterning the photosensitive layer formed at a position facing the pixel area to form a second photosensitive pattern; and

patterning the light blocking layer using the second photosensitive pattern as a mask to form a light visual angle pattern.

25. (Withdrawn) The method of claim 17, after forming the common electrode, further comprising:

forming a light blocking layer on the common electrode; and

patterning the light blocking layer to form a light blocking pattern having a lattice-shape, the light blocking pattern transmitting light incident into the pixel area and blocking light incident into between the pixel area and adjacent pixel area.

LAW OFFICES OF
MACPHERSON KWOK CHEN &
HEID LLP
1620 Von Karman
Irvine, CA 92614
(714) 755-2040
FAX (714) 755-2032

DO NOT ENTER: /NB/ (07/15/2008)

26. (Withdrawn) The method of claim 25, wherein a light visual angle pattern is further formed on the common electrode corresponding to the pixel area so as to widen a visual angle of an image while the light blocking layer is patterned.

27. (Withdrawn) The method of claim 25, after forming the common electrode, further comprising:

forming a transparent organic layer on the common electrode; and

patternning the transparent organic layer to form a transparent spacer at the light blocking pattern facing the color filter spacer.

28. (Withdrawn) The method of claim 27, wherein the pattern of the transparent organic layer further comprises forming a light visual angle pattern at a position facing the pixel area by patterning the transparent organic layer.

29. (Withdrawn) The method of claim 17, after forming the common electrode, further comprising:

forming a light blocking layer on the second transparent substrate;

forming a photosensitive layer on the light blocking layer; and

patternning the photosensitive layer to form a first photosensitive pattern having a lattice-shape, the first photosensitive pattern transmitting light incident into the pixel area and blocking light incident into between the pixel area and adjacent pixel area; and

patternning the light blocking layer using the first photosensitive pattern as a mask to form a light blocking pattern.

30. (Withdrawn) The method of claim 29, wherein the first photosensitive pattern is formed by:

patternning the photosensitive layer formed at a position facing the pixel area to form a second photosensitive pattern; and

patternning the light blocking layer using the second photosensitive pattern as a mask to form a light visual angle pattern.

LAW OFFICES OF
MACPHERSON KWOK CHEN &
HEID LLP
18200 Von Karman
SUITE 721
Irvine, CA 92614
(714) 253-7940
FAX (714) 253-2162

DO NOT ENTER: /NB/ (07/15/2008)

31. (Previously Presented) The liquid crystal display apparatus of claim 1, wherein the spacer has a column shape, the spacer being configured to maintain a cell gap between the first substrate and the second substrate.

32. (Previously Presented) The liquid crystal display apparatus of claim 1, wherein the common electrode makes direct contact with the spacer.

LAW OFFICES OF
MACPHERSON KWOK CHEN &
HEID LLP
1000 Van Ness
SUITE 711
OAKLAND, CA 94612
(415) 752-7040
FAX (415) 395-9263